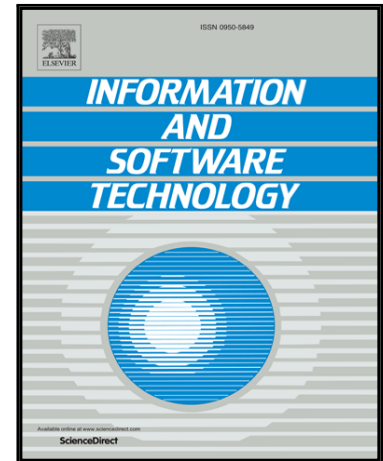


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Software architecture knowledge management approaches and their support for knowledge management activities: A systematic literature review

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Abstract

Context: Numerous approaches for Software Architecture Knowledge Management (SAKM) have been developed by the research community over the last decade. Still, these approaches have not yet found widespread use in practice.

Objective: This work identifies existing approaches to SAKM and analyzes them in terms of their support for central architecture knowledge management activities, i.e., capturing, using, maintaining, sharing, and reuse of architectural knowledge, along with presenting the evidence provided for this support.

Method: A systematic literature review has been conducted for identifying and analyzing SAKM approaches, covering work published between January 2004 and August 2015. We identified 56 different approaches to SAKM based on 115 studies. We analyzed each approach in terms of its focus and support for important architecture knowledge management activities and in terms of the provided level of evidence for each supported activity.

Results: Most of the developed approaches focus on using already-captured knowledge. Using is also the best-validated activity. The problem of efficient capturing is still not sufficiently addressed, and only a few approaches specifically address reuse, sharing, and, especially, maintaining.

Conclusions: Without adequate support for other core architecture knowledge management activities besides using, the adoption of SAKM in practice will remain an elusive target. The problem of efficient capturing is still unsolved, as is the problem of maintaining captured knowledge over the long term. We also need more case studies and replication studies providing evidence for the usefulness of developed support for SAKM activities, as well as better reporting on these case studies.

Keywords: software architecture, software architecture knowledge management, software architecture knowledge management activities, software architecture knowledge management approaches, systematic literature review

*Supplementary material to this review including a description of the identified approaches and quality assessment is available at <https://www.se.jku.at/akm-slr-supplementary-material>

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